

Rolling Knolls Landfill Settling Parties

Addendum 1 to the Quality Assurance Project Plan for the Data Gaps Sampling and Analysis Plan

Rolling Knolls Landfill Superfund Site

Chatham, New Jersey

October 2015



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**Addendum 1 to the
Quality Assurance Project Plan for the
Data Gaps Sampling and Analysis
Plan**

Rolling Knolls Landfill Superfund Site
Chatham, New Jersey

Prepared for:
Rolling Knolls Landfill Settling Parties

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2015 Quality Assurance Project Plan Addendum 1

This document serves as an Addendum to the Data Gaps Quality Assurance Project Plan (QAPP) for the Rolling Knolls Landfill Superfund Site (the site) located in Chatham, New Jersey (October 2014). This QAPP Addendum relates to the additional soil and sediment sampling required to complete the objectives originally identified in Section 1.1 of the Approved Data Gap Sampling and Analysis Plan (SAP) (November 2014) and to address additional delineation concerns identified by the U.S. Environmental Protection Agency (USEPA) and New Jersey Department of Environmental Protection (NJDEP) (letters dated June 17, 2015, August 17, 2015, and October 5, 2015) to further delineate the nature and extent of contamination at the site.

In addition, the Rolling Knolls Landfill Site Settling Parties (Group) is proposing additional sampling to that requested by USEPA and NJDEP. The purpose of these samples is to further delineate constituents of concern at the site. This addendum contains the sampling proposed by the USEPA, NJDEP, and the Group.

Information that was included in the approved December 2014 QAPP for the project should be followed, with the following additions to the worksheets specific to the additional delineation samples. The following worksheets have been revised:

Worksheet #14/16: Project Tasks & Schedule

Worksheet #17: Sampling Design and Rationale

Worksheet #18: Sampling Locations and Methods

Worksheet #20: Field QC Summary

QAPP Worksheet #14/16: Project Tasks & Schedule

Activity	Responsible party	Planned start date	Planned completion date	Deliverable(s)	Deliverable due date
Mobilization	ARCADIS	26 October 2015	26 October 2015	Field notes	26 October 2015
Underground utility clearing	ARCADIS	26 October 2015	26 October 2015	Field notes of New Jersey One-Call utility mark outs	26 October 2015
Sample collection – soil and sediment	ARCADIS	26 October 2015	20 November 2015	Field notes, map of boring locations, and soil logs	27 November 2015
Sample collection – porewater	ARCADIS	26 October 2015	20 November 2015	Field notes, map of locations	27 November 2015
Analysis of soil, porewater, and sediment samples	TestAmerica	27 October 2015	21 December 2015	Report of Analyses/Data package	21 December 2015
Validation of soil, porewater, groundwater and sediment data	ARCADIS	23 November 2015	15 January 2015	Validation summary report	22 January 2015
Third groundwater sampling event (all new wells)	ARCADIS	23 November 2015	4 December 2015	Field notes and purge logs	11 December 2015
Groundwater sample analysis	TestAmerica	24 November 2015	4 January 2016	Laboratory data packages	4 January 2016
Validation of third groundwater sampling event data	ARCADIS	22 December 2015	4 February 2015	Validation summary report	4 February 2016
Usability assessment	Project Team	January 2016	March 2016	Meeting minutes/Usability assessment summary report	March 2016

Activity	Responsible party	Planned start date	Planned completion date	Deliverable(s)	Deliverable due date
Final report	ARCADIS	22 January 2015	4 March 2016	Final report	4 March 2016

Note: The tasks included in this worksheet represent the remaining activities for the Data Gaps SAP implementation. The text section of the approved QAPP Worksheet #14 & 16 are not changed in the context of this Addendum, hence it is not repeated here.

QAPP Worksheet #17: Sampling Design and Rationale

Physical boundaries for the area under study

- Figure 1 depicts the estimated boundaries of the landfill and surface debris area based on observations during test pit activities. Eastern and southern portions of the landfill are located within the Great Swamp National Wildlife Refuge (GSNWR).

Time period being represented by the collected data

- The additional delineation soil and sediment sampling is scheduled for October and November 2015. All data will represent current conditions.

Description of the sampling area

- The sampling areas were selected to address additional delineation concerns identified by USEPA, NJDEP, and the Group following collection of the soil and sediment samples during the initial Data Gaps SAP implementation (November 2014 through March 2015).
- The sampling areas include soil along the perimeter of the estimated landfill boundary (SS-165 through SS-176), soil located in the interior of the landfill (SS-177 through SS-183), soil located in the vicinity of MW-10/MW-18 (SS-184 through SS-186) and MW-3 (SS-187 through SS-191), sediment along the perimeter of the estimated landfill boundary (SD-45 through SD-50 and SD-52 through SD-68), and sediment in ponds near the landfill (SD-51 and SD-69).

The matrices at the proposed sample locations were observed during a July 27, 2015 site visit conducted by ARCADIS and a representative of CDM Smith (consultant to the United States Army Corp of Engineers). Site conditions may change in response to precipitation or other factors. As a result, samples that are anticipated to consist of soil may be inundated and considered sediment at the time of sampling, and samples that were below water at the time of the site visit may be dry and considered soil at the time of sampling. The field crew will follow the appropriate standard operating procedure (SOP) (either SOP 14 [sediment sampling], SOP 5 [drilling procedures for soil sampling], or SOP 17 [manual procedures for soil sampling]) based on the current conditions during the time of sampling.

Sample locations

- **Soil samples.** The proposed soil sampling locations are shown on Figures 2a and 2b.
 - a. Basis for the number and placement of samples: A total of 46 soil samples will be collected. Soil sampling locations located off the boundary of the landfill in native soil (SS-165 through SS-176) are near where previous soil samples contained concentrations of one or more constituents of concern (COCs) exceeding its New Jersey Soil Remediation Standard (SRS) or in areas identified as potential depositional zones. Soil sampling locations located within the interior of the landfill (SS-177 through SS-183) were selected to define the vertical delineation within the landfill. Soil sampling locations

between MW-10 and MW-18 (SS-184 through SS-186) and near monitoring well MW-3 and adjacent to former temporary well points TWP-5 through TWP-9 (SS-187 through SS-191) were selected to evaluate volatile organic compounds (VOCs) in surface soil near monitoring wells with VOCs detected in groundwater greater than the New Jersey Groundwater Quality Criteria (GWQC). The soil samples collected from locations SS-165 through SS-176 will be analyzed for semivolatile organic compounds (SVOCs) (including SVOCs by selective ion monitoring [SIM]), polychlorinated biphenyls (PCBs) as Aroclors, pesticides, target analyte list (TAL) metals, and cyanide. In addition, the sample collected from location SS-168 will also be analyzed for PCB congeners and dioxins/furans. The soil samples collected from locations SS-177 through SS-183 will be analyzed for full target compound list (TCL)/TAL (i.e., VOCs, SVOCs, PCBs as Aroclors, pesticides, metals, and cyanide) and SVOCs by SIM. The soil samples collected from locations SS-184 through SS-191 will be analyzed for VOCs only.

- b. How sample positions will be located: Sample locations were selected in consultation with USEPA and NJDEP. They will be located using site landmarks (e.g., monitoring wells or other permanent features) and global positioning system (GPS). All proposed soil sampling locations will be surveyed to satisfy NJDEP requirements.
 - c. If a soil sample cannot be collected where planned, the sample location may be moved to another location within 10 feet of the proposed location. If a suitable location is not available within 10 feet of the proposed location, the need for a field change request will be discussed with USEPA prior to relocating the sample.
- **Sediment samples.** The proposed sediment sampling locations are shown on Figures 2a and 2b.
 - a. Basis for the number and placement of samples: A total of 50 sediment samples will be collected. Sediment samples will be collected from surface water bodies near the landfill that were not sampled during the previous investigations, and along the perimeter of the estimated landfill boundary. The sediment samples collected from locations SD-45 through SS-60 and SD-63 through SD-69 will be analyzed for SVOCs (including SVOCs by SIM), PCBs as Aroclors, pesticides, TAL metals, cyanide, pH, total organic carbon (TOC), and grain size. The sediment samples collected from locations SD-61 and SD-62 will be analyzed for full TCL/TAL (i.e., VOCs, SVOCs, PCBs as Aroclors, pesticides, metals, and cyanide), SVOCs by SIM, pH, TOC, and grain size. The sediment samples collected at location SD-52 and SD-69 will also be analyzed for PCB congeners. The sediment samples collected at locations SD-53, SD-61 and SD-63 will also be analyzed for dioxins/furans. The sediment samples collected at locations SD-57 and SD-62 will also be analyzed for both PCB congeners and dioxins/furans.
 - b. How sample positions will be located: Sample locations were selected in consultation with USEPA and NJDEP. They will be located using site landmarks (e.g., monitoring wells or other permanent features) and GPS. All proposed sediment sampling locations will be surveyed to satisfy NJDEP requirements.

- c. If a sediment sample cannot be collected where planned, the sample location may be moved to another location within 10 feet of the proposed location. If a suitable location is not available within 10 feet of the proposed location, the need for a field change request will be discussed with USEPA prior to relocating the sample.

QAPP Worksheet #18: Sampling Locations and Methods

Sample ID	Matrix*	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SS-165 SS-166 SS-167 SS-169 SS-170 SS-171 SS-172 SS-175 SS-176	Soil	0.0-1.0 and 1.0-2.0	Macrocore	SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide	SOP 5, 17	
SS-168	Soil	0.0-1.0 and 1.0-2.0	Macrocore	VOCs, SVOCs, SVOCs- SIM, PCBs (as Aroclors), PCB congeners, Dioxins/Furans, Pesticides, TAL Metals, Cyanide	SOP 5, 17	
SS-173 SS-174	Soil	0.0-1.0 and 1.0-2.0	Macrocore	SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide	SOP 5, 17	
SS-177 SS-178 SS-179 SS-180 SS-181	Soil	TBD+ Note: Two samples will be collected from each location.	Macrocore	VOCs, SVOCs, SVOCs- SIM, Pesticides, PCBs (as Aroclors), TAL Metals, Cyanide	SOP 5, 17	

Sample ID	Matrix*	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SS-182 SS-183						
SS-184 SS-185 SS-186 SS-187 SS-188 SS-189 SS-190 SS-191	Soil	0.5-1.0	Macrocore	VOCs	SOP 5, 17	
SD-45 SD-46 SD-47 SD-48 SD-49 SD-50 SD-51 SD-54 SD-55 SD-56 SD-58 SD-59 SD-60	Sediment	0.0-1.0 and 1.0-2.0	Lexan or Macrocore sampler	SVOCs, SVOCs-SIM, PCBs (as Aroclors), Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	

Sample ID	Matrix*	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SD-64 SD-65 SD-66 SD-67 SD-68						
SD-61	Sediment	0.0-1.0 and 1.0-2.0	Lexan or Macrocore sampler	VOCs, SVOCs, SVOCs- SIM, PCBs (as Aroclors), Dioxins/Furans, Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	
SD-52 SD-69	Sediment	0.0-1.0 and 1.0-2.0	Lexan or Macrocore sampler	SVOCs, SVOCs-SIM, PCBs (as Aroclors), PCB congeners, Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	
SD-62	Sediment	0.0-1.0 and 1.0-2.0	Lexan or Macrocore sampler	VOCs, SVOCs, SVOCs- SIM, PCBs (as Aroclors), PCB congeners, Dioxins/Furans, Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	
SD-57	Sediment	0.0-1.0 and 1.0-2.0	Lexan or Macrocore sampler	SVOCs, SVOCs-SIM, PCBs (as Aroclors), PCB congeners, Dioxins/Furans, Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size	SOP 14	
SD-53	Sediment	0.0-1.0 and	Lexan or	SVOCs, SVOCs-SIM,	SOP 14	

Sample ID	Matrix*	Depth (ft bgs)	Type	Analyte/Analytical Group	Sampling SOP	Comments
SD-63		1.0-2.0	Macrocore sampler	PCBs (as Aroclors), Dioxins/Furans, Pesticides, TAL Metals, Cyanide, pH, TOC, Grain Size		

Abbreviations:

ft bgs – feet below ground surface

PCBs – polychlorinated biphenyls

SOP – standard operating procedure

SVOC – semivolatile organic compounds

SVOC-SIM – semivolatile organic compounds by selective ion monitoring

TAL – target analyte list

TBD – to be determined; sample depth is contingent on the depth of landfilled material observed in the boring and the depth of the clay layer. One sample will be collected immediately beneath the landfilled material and one sample will be collected immediately above the clay.

TOC – total organic carbon

VOC – volatile organic compounds

SOPs are available in the QAPP (ARCADIS; December 2014).

* – The matrices at the proposed sample location were observed during a July 27, 2015 site visit conducted by ARCADIS and a representative of CDM Smith (consultant to the United States Army Corp of Engineers). Site conditions may change in response to precipitation or other factors. As a result, samples that are anticipated to consist of soil may be inundated and considered sediment at the time of sampling, and samples that were below water at the time of the site visit may be dry and considered soil at the time of sampling. The field crew will follow the appropriate SOP (either SOP 14 [sediment sampling], SOP 5 [drilling procedures for soil sampling], or SOP 17 [manual procedures for soil sampling]) based on the current conditions during the time of sampling.

+ – Samples will be collected from the first foot beneath the waste material and the first foot directly above the underlying clay layer at each location.

QAPP Worksheet #20: Field QC Summary

Matrix	Analyte/Analytical Group	Test Method / SOP	Field Samples	Field Duplicates	Matrix Spikes	Matrix Spike Duplicates	Equipment Blanks	Trip Blanks	Total # analyses
Soil	VOCs	SOM01.2/TAB-4	24	2	2	2	2	2	34
Soil	SVOCs	SOM01.2/TAB-3	38	2	2	2	2	0	46
Soil	SVOCs-SIM	SOM01.2-SIM/TAB-3	38	2	2	2	2	0	46
Soil	PCBs (as Aroclors)	SOM01.2/TAB-1	38	2	2	2	2	0	46
Soil	Pesticides	SOM01.2/TAB-2	38	2	2	2	2	0	46
Soil	TAL Metals, Mercury, Cyanide	ISM01.3/TAB-5, TAB-6, TAB-7	38	2	2	2	2	0	46
Soil	PCB Congeners	EPA 1668/TAWS-1	2	1	1	1	1	0	6
Soil	Dioxins and Furans	EPA 1613/TAWS-2	2	1	1	1	1	0	6
Sediment	VOCs	SOM01.2/TAB-4, TAB-11	4	1	1	1	1	1	9
Sediment	SVOCs	SOM01.2/TAB-3	50	3	3	3	3	3	65
Sediment	SVOCs SIM	SOM01.2-SIM/TAB-3	50	3	3	3	3	3	65
Sediment	PCBs (as Aroclors)	SOM01.2/TAB-1	50	3	3	3	3	3	65
Sediment	Pesticides	SOM01.2/TAB-2	50	3	3	3	3	3	65
Sediment	TAL Metals, Mercury and Cyanide	ISM01.3/TAB-5, TAB-6, TAB-7	50	3	3	3	3	3	65

Matrix	Analyte/Analytical Group	Test Method / SOP	Field Samples	Field Duplicates	Matrix Spikes	Matrix Spike Duplicates	Equipment Blanks	Trip Blanks	Total # analyses
Sediment	PCB Congeners	EPA 1668/ TAWS-1	8	1	1	1	1	1	13
Sediment	Dioxins and Furans	EPA 1613/TAWS- 2	10	1	1	1	1	1	15
Sediment	pH, TOC, grain size	Lloyd Kahn/TAB-9	50	3	3	3	0	0	59

Abbreviations:

PCBs – polychlorinated biphenyls

SOP – standard operating procedure

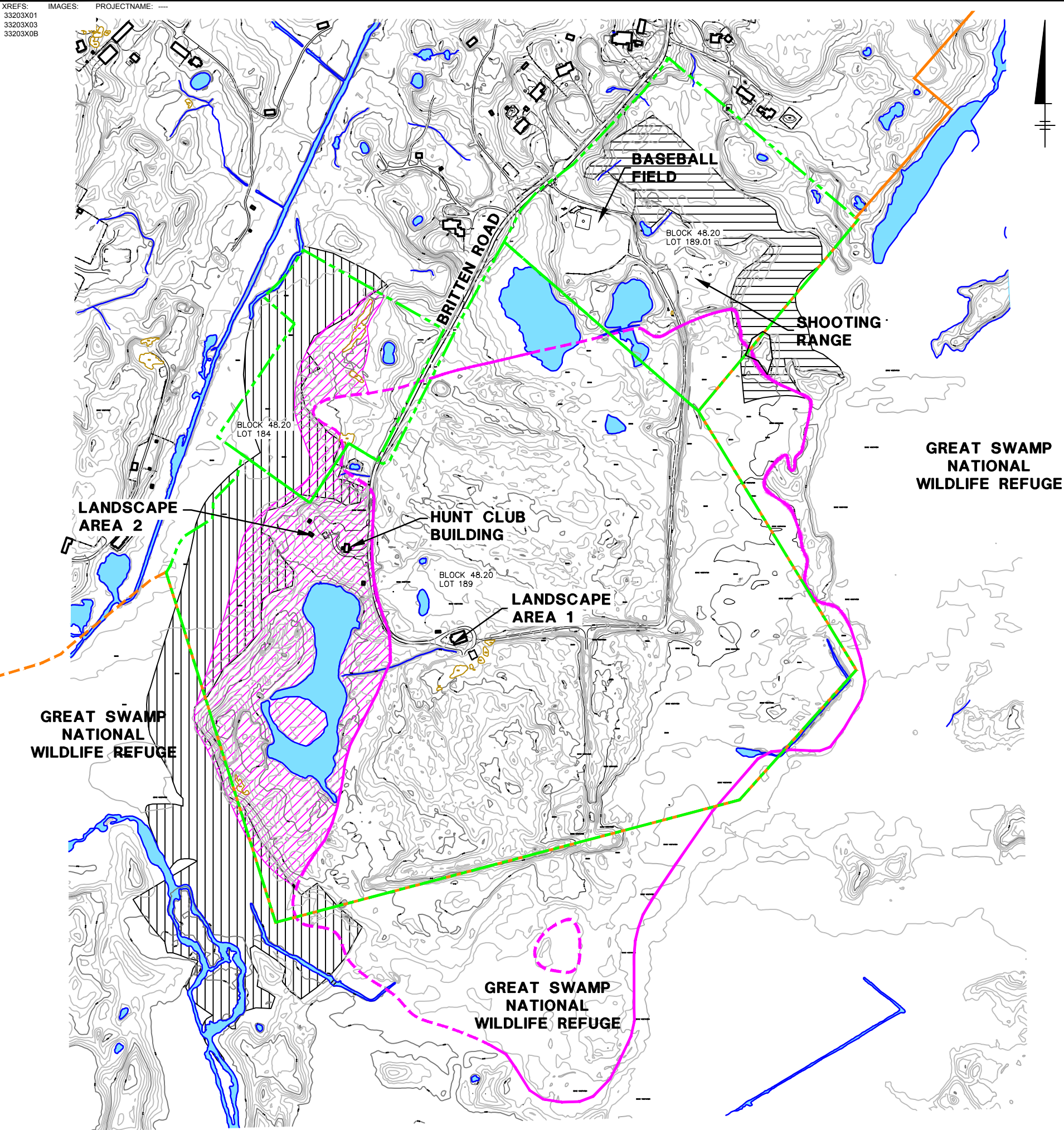
SVOC – semivolatile organic compounds

SVOC-SIM – semivolatile organic compounds by selective ion monitoring

TAL – target analyte list

TOC – total organic carbon

VOC – volatile organic compounds



LEGEND:

- OPEN WATER
- EDGE OF LANDFILLED WASTES OBSERVED DURING TEST PIT ACTIVITIES (DASHED WHERE APPROXIMATE)
- GREAT SWAMP NATIONAL WILDLIFE REFUGE PROPERTY BOUNDARY (DASHED WHERE APPROXIMATE)
- TAX PARCELS
- WASTE AND DEBRIS OBSERVED ON GROUND SURFACE BUT NOT OBSERVED OR ANTICIPATED TO BE BELOW GROUND SURFACE
- POTENTIAL BOG TURTLE HABITAT AREA A (35.31 ACRES)
- POTENTIAL BOG TURTLE HABITAT AREA B (10.89 ACRES)

NOTES:

1. THE PRE-REMEDIAL INVESTIGATION PROJECTED EDGE OF LANDFILLED MATERIALS ON THIS FIGURE IS APPROXIMATE AS DRAWN AND IS BASED ON VISUAL OBSERVATIONS OF THE GROUND SURFACE MADE DURING SITE VISITS CONDUCTED JUNE 20, 2006 THROUGH JULY 14, 2006.
2. THE EDGE OF LANDFILLED WASTES OBSERVED DURING TEST PIT ACTIVITIES IS DRAWN BASED ON OBSERVATIONS OF MATERIALS EXCAVATED DURING TEST PIT ACTIVITIES CONDUCTED FROM JULY 26, 2007 TO SEPTEMBER 6, 2007 AND MARCH 26, 2008.
3. THE PORTION OF THE GREAT SWAMP NATIONAL WILDLIFE REFUGE (GSNWR) PROPERTY BOUNDARY ON THIS FIGURE WITHIN CHATHAM TOWNSHIP, NJ WAS OBTAINED FROM CHATHAM TOWNSHIP TAX PARCEL DATA PROVIDED BY CIVIL SOLUTIONS. THE PORTION OF THE GSNWR PROPERTY BOUNDARY ON THIS FIGURE OUTSIDE OF CHATHAM TOWNSHIP IS APPROXIMATE AND WAS OBTAINED FROM THE UNITED STATES FISH AND WILDLIFE SERVICE (GEOGRAPHIC INFORMATION SYSTEMS AND SPATIAL DATA).
4. BLOCK 48.20, LOTS 184 AND 189 ARE OWNED BY ROBERT J. MIELE AS TRUSTEE FOR THE TRUST CREATED BY THE LAST WILL AND TESTAMENT OF ANGELO J. MIELE. BLOCK 48.20, LOT 189.01 IS OWNED BY THE GREEN VILLAGE FIRE DEPARTMENT.

SOURCES:

1. BASEMAP FROM JAMES M. STEWART INC., LAND SURVEYORS, PHILADELPHIA, PA., (ELECTRONIC FILE: 292406.DWG DATED: 6/30/06)
2. TAX PARCEL DATA FOR CHATHAM TOWNSHIP WAS PROVIDED BY CIVIL SOLUTIONS.



ROLLING KNOLLS LANDFILL SUPERFUND SITE
CHATHAM, NEW JERSEY
QUALITY ASSURANCE PROJECT PLAN

SITE PLAN



FIGURE
1

